

petioled, ovate acuminate in shape, 2-4 in. long, coarsely toothed, with nerves deeply impressed on the upper surface, prominent beneath. Upper surface and petiole more or less covered with coarse short hairs, under surface hairy on the nerves only. The under surface between the nerves is deeply pockmarked with glandular pits.

Inflorescence in congested, bracteate dichotomous cymes. Bracts, bracteoles, peduncle and pedicel, sparsely covered with coarse hairs. Calyx divided almost to the base into 5 lanceolate-acuminate lobes, dark red in colour, sparsely hairy, $1\frac{1}{2}$ in. long. Corolla red, tubular, divided above into 5 lanceolate-obtuse lobes, $1/3-1/2$ in. long. Stamens four with widely divaricate anthers; filaments arising from the base of the corolla. Ovary seated on a disk. At the insertion of the stamens towards the base of the corolla is a narrow ring of club-shaped yellow glands. There is another line of glandular rod-shaped hairs running down from the mouth towards the base.

Flowers.—Most part of the year. Does not set seed in this country.

Distribution.—Indigenous to Mexico ascending to 8,000 ft., now grown in gardens throughout the tropics.

Gardening.—A handsome erect plant with deep scarlet flowers borne in crowded bunches along the stem. Propagated by division of the root as cuttings are less successful. This species is also known as *R. multiflora* Sims.

(To be continued.)

THE EARLY STAGES OF INDIAN LEPIDOPTERA.

BY

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PART XVI

(Continued from Vol. 46, p. 269).

HETEROCERA.

DREPANIDAE.

Callidrepana patrana Moore.

Head black, bifid above. Body dark olive green, the lateral and subdorsal areas of the thoracic somites, all the 4th, and a lateral blotch on the 9th somite, black. 5th somite with an olive tinged orange lateral spot. A lilac line at the base of the 3rd and 4th pairs of prolegs. Thoracic somites expanded laterally into bifid lobes. 5th to 8th somites with slight, double, dorsal humps, with

somite with a dorsal tubercle. Anal somite produced into a long process, anteriorly thin and hyaline, then thickened and grey, the junction of the two parts olive. Legs black. Prolegs grey, the anal pair absent. The surface of the body shining as if oiled. Resting attitude with the head and forepart of the body curved along the posterior in a U and resembling a lump of wet snail excreta.

Pupa formed on a pad of black silk spun on a leaf and with a few strands of black silk spun across the posterior somites. Shape short and stout, the thorax keeled and with a dorsal keel on the 2nd to 4th abdominal somites. Colour bronzy black, a burnished blotch on each side of the thoracic keel.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 6-vi-44, pupated 9-vi-44 and a female emerged 17-vi-44.

Psiloreta obliquilinea Hamps.

Head purple black, divided above into two blunt points. Body blackish purple, a black lateral stripe on the thoracic somites, a black dorsal blotch on the 2nd and 3rd, a black dorsal line from 3rd to 7th, and a black lateral stripe from 5th to 9th somite, this latter straight below but coming to a point above on the 7th somite. 3rd somite with a short, backward-curved, dorsal process, a double dorsal point on the 7th somite and a black dorsal tubercle on the 11th. Anal somite produced backwards into a long, upcurved process with a white median ring. Venter olive black. Legs olive black. Prolegs purple black with the body immediately above expanded into a short flange. Anal prolegs absent.

Pupa in a thin cocoon in a rolled leaf. Dark chestnut brown, the 4th to 6th abdominal somites tinged laterally and ventrally with yellow. The pro-thorax and the anterior half of the meso-thorax covered with a white, mealy powder and with smaller lateral patches on the meta-thorax and 1st abdominal somite.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 4-vi-44, spun 12-vi-44 and a male emerged 22-vi-44.

SATURNIDAE.

Samia cynthia Drury.

Hamps., *Fauna Brit. Ind.*, Moths, i, 16. 1892.

Seitz, *Seitz Indo-Austr. Bombyces*, x, 505. 1928.

Ovum—Very pale buff, longitudinally striped with darker. Micropyle a dark spot. Barrel-shaped, the ova deposited on their sides. Laid in small batches. Hatched 12-vi-44.

1st instar—Head black. Body yellowish. A black dorsal plate on the 1st somite. 2nd somite backwards with two transverse series of black dots on each somite and with a subdorsal,

lateral and sublateral series of setiferous, black tubercles. Moulded 18-vi-44.

2nd instar—Head black. Body yellow. Each somite with a dorsal, subdorsal and lateral series of two black spots. A black setiferous tubercle between each series of spots and an additional sublateral tubercle. legs and prolegs black. Moulded 23-vi-44.

3rd instar—Head black. Body white with a dorsal, subdorsal and lateral series of two black spots on each somite. 1st to 10th somites each with a subdorsal and a lateral white, and a sublateral black, setiferous tubercle. 11th somite with one dorsal and a lateral white, and a sublateral black, setiferous tubercle. 12th somite with a transverse series of four, and 13th with two, white tubercles. Legs black. Abdominal prolegs white banded with black. Anal claspers black. Moulded 29-vi-44.

4th instar—Similar, but the head yellow with a black stripe on each side posteriorly and the legs and prolegs yellow. Moulded 3-vii-44.

5th instar—Head greenish yellow. Body very pale blue green covered with a white mealy powder. Tubercles as in previous instar but bluish in colour and the sublateral series with a black basal ring. The subdorsal and lateral tubercle on the 1st somite very small. Spiracles black with a small black spot immediately behind in addition to the paired black spots of the previous instars. A series of two black streaks on each somite below the sublateral tubercles. Legs yellow with a black spot at the base. Abdominal prolegs pale blue with an oblique black line. Anal claspers and flap yellow outlined with blue. 12th somite yellow dotted with black. Spun 10-vii-44.

The larvae are gregarious for the first two instars but separate in the third. A few larvae had a 6th instar, similar to the 5th except that the subdorsal tubercles on the 2nd to 10th and the dorsal one on the 11th somite were pale pink instead of blue.

Cocoon of tough, yellow-brown silk, the Eri silk of commerce, roughly spindle shaped, frequently spun in a leaf with the leaf-stalk covered with silk attaching it to the twig. Pupa pale chestnut brown, the thorax and abdomen darker on the dorsum. Abdominal somites contracted. Antenna sheath very large in the male pupae. Wing cases with the hind-wing projecting considerably beyond the forewing. A male emerged 4-viii-44.

Food-plant—*Lagerstroemia indica* L. I have also reared it on *Ricinus communis* in Calcutta.

Described from larvae bred from ova found at Tukdah (5,000 ft. Darjeeling District).

Hampson's description is 'Larva pale green or whitish, with one dorsal and two lateral pairs of darker spines. Cocoon pale brown.' Seitz describes the ovum as being white, slightly black-dotted, and states that the 'young larva is darker, then lighter yellow, yellowish green, and at last bluish green, all over covered with fine black dots, and with a dense white bloom on it...it also exhibits on each segment 6 coniform points.'

SPHINGIDAE.

Acosmeryx naga Moore.

Mell, *Biol. u. System. der Sudchin. Sphing.*, 225, pl. xviii, figs. 5, 6, pl. xxvii, fig. 13. 1922.

Seitz, *Seitz Indo-Austr. Bombyces*, x, 550. 1929.

Bell & Scott, *Fauna Brit. Ind.*, Moths, v, 292, pl. iv, figs. 1, 2, pl. xiv, fig. 14. 1937.

Penultimate instar—Head green, a central paler green stripe and a lateral yellowish stripe, which joins the subdorsal body stripe. Body green heavily speckled with yellow along the secondary segmental rings. A subdorsal yellowish stripe on the 1st to 3rd somites, which becomes lateral on the 4th somite and continues to the base of the horn, the colour of the stripe from the 5th somite backwards being white shading into deep pink above. A spiracular series of oblique yellow stripes. 4th somite expanded sublaterally into a slight lobe, the lobe yellowish edged with dark brown below. The spiracle on the 4th somite set in a black ring. Legs purple, the base black. Venter and prolegs green. Horn purplish at base grading into yellow at the apex, and covered with minute black tubercles, long and slightly upcurved.

Final instar—Very similar. Spiracles black with an orange pink rim. Legs dark brown. Horn shorter, down—curved, purple and tuberculate.

Pupa in a slight web amongst litter. Dark purple-brown, the lateral and ventral areas blotched and mottled with yellowish-buff and with a yellowish-buff crescent in front of the eye. The front edges of the abdominal somites punctate. Rear edge of the 7th abdominal somite strongly undercut, so that the succeeding segment appears much inset. 8th, and succeeding, abdominal somites deeply pitted. Cremaster black, a bulb ending in a stout spike with bifid tip. Spiracles black.

Food-plant—Virginia Creeper.

Described from a larva found at Tukdah (5,000 ft. Darjeeling District) 13-vi-44, pupated 26-vi-44 and a male emerged 29-vii-44.

Seitz' description is 'Larva very similar to that of *Ampelophaga*, dark green with a yellow subdorsal stripe and lighter or darker green, hardly noticeable oblique stripes below it. The 4 first rings are defined on the dorsum in the shape of a thoracal shield which is bordered by yellow and behind it by red-brown. The horn of the grown-up insect is small, green, curved below. On *Actinidia fulvicoma*, perhaps also on vine.' Bell & Scott give an excellent figure, except that the horn is shewn as a pale blue, in spite of the detailed description stating that it is purple. They also mention the occurrence of brown form, but I have not bred it.

Rhagastis albomarginatus Roths., *albomarginatus*.

Manson, *Journ. Bomb. Nat. Hist. Soc.*, xxvii, 753. 1921.

Seitz, *Seitz Indo-Austr. Bombyces*, x, 569. 1929.

Scott, *Journ. Bomb. Nat. Hist. Soc.*, xxxv, pl. ii, fig. 7. 1931.

Bell & Scott, *Fauna Brit. Ind.*, Moths, v, 479, pl. vii, figs. 1-3, pl. xv, fig. 11. 1937.

Penultimate instar—Head blue. Body green dotted with white along the secondary segmental rings. A dark blue-green dorsal line and a white subdorsal stripe on the thoracic somites and a series of oblique, white, lateral stripes on the abdominal, the last stripe not reaching the base of the horn. 4th somite with a protuberant ocellus, the pupil blue speckled with darker blue, the iris white and the whole rimmed with dark blue. Horn dark grey blue, down-curved, slightly compressed from side to side, tapering gradually from base and finally expanded into a knob and with a double row of black points along it. Legs, prolegs and anal flap greenish blue. Venter bluer green.

Final instar—Similar. The head more tinged with green. The ocellus with the pupil dark blue ringed with paler. Spiracles white. There is a considerable difference in the shade of green, some larvae being much more tinged with blue than others.

Pupa in a slight web among litter. Colour pale brown, the head, thorax and wing cases tinged with olive. An interrupted black ventral line on the abdominal somites, and a fuscous latero-ventral and dorsal stripe. Some fuscous shading on the spiracular area. Cremaster triangular, hollowed out below, and ending in two stout spines with bifid tips, and with two dorso-lateral black spines above. Tongue case projecting slightly ventrally. Legs and wing cases along the veins, with small raised points.

Food-plant—Cultivated Hydrangea (*Saxifragaceae*) and on an unidentified wild plant of the same order.

Described from a larva found at Tukdah (5,000 ft. Darjeeling District) 22-vi-44, pupated 1-vii-44 and a male emerged 23-vii-44.

Seitz' description is as follows:—'Larva grey, sham-eye on the 4th ring not so large as in the other larvae known of *Rhagastis*. On the sides very thick and long white oblique stripes, the last of which begins at the horn and extends to the last prolegs. The horn itself is slightly flaved and with an insignificant swelling above the base. On *Dichroa febrifuga* or Hydrangea and other plants.' He thus omits to mention the most distinctive feature of the larva, the marked protuberance of the ocelli on the 4th somite.

Rhagastis olivacea Moore.

Mell, *Biol. u. System. der Sudchin. SpHING.*, 324, pl. xii, figs. 23-27, pl. xix, figs. 29, 30. 1922.

Seitz, *Seitz Indo-Austr. Bombyces*, x, 569. 1939.

Bell & Scott, *Fauna Brit. Ind.*, Moths, v, 476, pl. vi, figs. 17, 18, pl. xv, fig. 7. 1937.

Ovum—Milky white tinged with green, ovoid. Laid singly on the underside of leaves of the food-plant. Hatched 28-v-44.

1st instar—Whitish green, unmarked. After feeding becomes darker and, in the case of larvae feeding on purple leaved balsam, tinged with purplish. Horn long and straight, black, the extreme base orange, the tip bifid. Moulded 1-vi-44.

2nd instar—Very similar to previous instar. Thoracic somites tapered and 4th somite somewhat swollen. 4th somite with an

indistinct subdorsal ocellus consisting of a yellowish ring enclosing a bluish pupil. Traces of oblique white lateral stripes. Moulded 5-vi-44.

3rd instar—Similar to preceding with the markings all more defined. The ocellus with the pupil from front to rear a quarter blackish blue, a quarter dark blue and half blue-green, surrounded by a ring, white anteriorly and yellow posteriorly, edged with black. The secondary segmental rings speckled with white. Horn stouter, straight, purplish and tuberculate. Moulded 9-vi-44.

4th instar—Head green. Body yellow green speckled with yellow along the secondary segmental divisions. A dark dorsal line, and a white subdorsal stripe on the thoracic somites. A series of oblique white lateral stripes edged above with darker green from 4th somite backwards, the last stripe joining the base of the horn. The ocellus on the 4th somite with the posterior half of the pupil bright green containing two white dots, the anterior half very dark blue in front shading into bright blue behind, the surrounding ring white anteriorly and yellow posteriorly and edged with an indigo line. Horn deep yellow, stout, the apex pointed, minutely tuberculate. Legs, prolegs and venter green. Spiracles cream. Moulded 13-vi-44.

Final instar—Green form very similar to previous instar. The horn medium in length, slightly down-curved and purple-brown in colour. The brown form with the markings similar to the green form but with the ground colour a rich tobacco brown, speckled with white along the secondary segmental divisions. The ocellus with the pupil very dark olive, almost black. The lateral areas suffused with lilac. Horn olive brown. Pupated 25-vi-44.

Pupa in a slight cocoon amongst litter. Head, thorax and wing cases dark chocolate brown. Abdomen with the lateral area dark chocolate, the venter and dorsum paler brown streaked and speckled with darker. A dark dorsal stripe. Intersegmental areas olive green. Proboscis sheath projecting slightly frontally and ventrally, rounded. Leg sheaths with small raised points. Cremaster excavate below and ending in two forked spines. A female emerged 17-vii-44.

Food-plant—*Impatiens* spp. Bell & Scott add *Vitis* and Aroid-ae.

Described from larvae bred from ova found at Tukdah (5,000 ft. Darjeeling District).

Seitz' description is as follows:—'Larva leaf green, with a large yellow-edged sham-eye on the 4th ring; from this eye to the head a yellow longitudinal line. In the sides white oblique stripes alternating with green triangles.'

NOTODONTIDAE.

Somera viridifusca Wlk.

Head greyish white, the clypeus filled in with pale olive and with a pale olive streak on either side not reaching the vertex. An inverted J-shaped black lateral streak, which joins the subdorsal body-stripe, with the front filled in with lavender and with a short

cherry coloured bar below. Body with the dorsum yellow-green bounded by a white stripe and with a double yellow dorsal line. The white subdorsal stripe shading into yellow on the 1st somite, edged above with black on the 2nd, with a large cherry-red spot in it on the 7th, in some examples with smaller cherry-red spots on the 3rd, 5th, 6th and 8th somites, and edged above with purplish shading into black posteriorly on the 12th and 13th somites, the anterior and posterior portion on all somites tinged with yellow. The area below the subdorsal stripe green. Spiracles cream, edged behind with black and with a white spot above and to the rear. Venter, legs and prolegs bluer green.

Pupa subterranean. Dark purple brown and very shiny. Apex of abdomen blunt and armed with two fine spines. Wing cases short.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 21-vi-44, buried 22-vi-44 and a female emerged 3-vii-44.

NOCTUIDAE.

Acronicta indica Moore.

Sevastopulo, *Journ. Bomb. Nat. Hist. Soc.*, xlii, 755. 1941.

Examination of further larvae found at Tukdah (5,000 ft. Darjeeling District) in May 1944 has revealed a small error in the above quoted description. The triple subdorsal tuft of black hair is placed on the 4th somite, not on the 3rd as originally stated.

Food-plant—Also on Rose, *Salvia* sp., *Melastoma normale* Don.

Moma champa Moore.

Gardner, *Indian Forest Records*, vi, 265. 1941.

Head olive brown. Body dark slate blue, a dorsal and subdorsal terra-cotta line, the area between from 4th to 10th somite speckled with white. Each somite laterally with an anterior oblique terra-cotta stripe and a posterior erect one. A subdorsal series of tubercles each bearing a few long dark hairs, the tubercles on the 2nd and 11th somites much larger, the former clothed with golden brown, the latter with dark brown pubescence. An interrupted white sublateral stripe with a fringe of snow white hair. 1st somite with a lateral tubercle with a pencil of long white hairs. Spiracles white. Venter blackish with a median purple stripe. Legs blackish. Prolegs pink.

Cocoon of whitish silk and spun among leaves. Pupa shining, dark red-brown, the intersegmental areas olive. A pale yellow-brown central spot on the head.

Food-plant—Rose. Gardner gives *Pyrus communis* and *Prunus communis*.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 4-vi-44, spun 11-vi-44 and a male emerged 28-vi-44.

This larva differs considerably from the figure of that of *Moma ludifica* L., given by Hampson (1913, *Cat. Lep. Phal.*, xiii, 336),

which shews a larva with longish subdorsal tufts of hair and the fore- and hind-part raised. My larvae all rested gripping with the true legs, abdominal prolegs and anal claspers.

Polia (Hadena) consanguis Guen.

Head brownish olive, minutely reticulated with darker, and with a dark stripe outlining the median suture and clypeus. Body blackish grey, traces of a darker dorsal line and a paler subdorsal stripe, edged below with an interrupted black line. A pinkish-buff sublateral stripe, between which and the subdorsal stripe there are three indistinct dark-edged paler lines. Spiracles black. Venter, legs and prolegs blackish grey.

Pupa subterranean in a slight earthen cocoon. Chestnut brown, the abdominal somites with the anterior edge darker and punctate. Wing-cases paler. Cremaster a double, divergent spine.

Food-plant—Grasses.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 29-v-44, buried 4-vi-44 and a female emerged 24-vi-44.

Tiracola plagiata Wlk.

Moore, *Lep. Ceyl.*, iii, 34, pl. 148, fig. 1a. 1884-7.

Hamps., *Fauna Brit. Ind.*, Moths, ii, 283. 1894.

Hamps., *Cat. Lep. Fal.*, v, 259. 1905.

Warren, *Seitz Indo-Austr. Noctuidae*, xi, 74. 1913.

Head red brown, darker frontally. Body black, minutely streaked and speckled with grey and with the dorsal area tinged with olive. A black dorsal line, most distinct on the thoracic somites. A very pale greenish-yellow lateral blotch on the 4th to 6th and 10th to 11th somites, in some examples with traces of a cream lateral stripe between. A few colourless hairs arising from minute warts, a dorsal pair on the 4th, 5th and 6th somite rather larger than the others. 11th somite humped and with two large dorsal warts. Legs red brown ringed with black. Venter and prolegs dark olive tinged with reddish. At the beginning of the instar the ground colour is distinctly black, as the instar progresses it becomes more and more tinged with olive.

Pupa subterranean in a slight earthen cocoon. Dark chestnut brown, a dorsal line and the intersegmental areas darker. Cremaster a fan of four stout spines, with two more slender spines above.

Food-plant—Polyphagous, eating a large number of unidentified low plants and shrubs. All previously published descriptions give *Emilia* as the food-plant.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 4-vi-44, buried 10-vi-44 and a female emerged 3-vii-44.

All published descriptions seem to be based on Moore's which is as follows:—'Larva dull violet-brown; with a few fine dorsal hairs, a few scattered grey dots, and a sublateral pale olivaceous band from fourth segment; head small; head and legs violet grey;

twelfth segment conical. Pupa dark red.' The figure is most unlife-like and shews a dark purple larva with a sublateral pale olive stripe edged above by a white line from the 4th somite backwards, and with a brown head and legs.

Consercula indica Moore.

Head pale brown, reticulated with darker. Body golden brown minutely speckled with darker. An orange dorsal stripe, a dorsal series of darker brown V-shaped marks, and a subdorsal series of slightly oblique orange stripes. A white spiracular line, edged below narrowly with orange. Spiracles white ringed with dark brown. Venter and prolegs golden brown. Legs pinkish.

Pupa subterranean in a cocoon of brownish silk covered with earth. Bright chestnut brown, shining. Cremaster two stout, outwardly curved, spines with some smaller spines ventrally.

Food-plant—Bracken.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 22-v-44, buried 28-v-44 and a male emerged 21-vi-44.

Warren (1913, *Seitz Indo-Austr. Noctuidae*, xi, 155) describes the larva of the closely allied *C. v-brunneum* Guen. as spinning up in a slight cocoon among the fronds. My larvae quite definitely buried.

Callyna contracta Warr.

Head black, edged behind with yellow. Body black. 1st somite with a subdorsal yellow streak joining a transverse yellow stripe and sublateral yellow speckling. 2nd somite with two transverse yellow stripes which join on the lateral area, and sublateral yellow reticulations. 3rd somite with a transverse yellow line anteriorly. 4th somite with two white transverse stripes with a white line, with two streaks behind it, between them. 5th to 7th somites each with two transverse white stripes with two streaks between them. 8th somite with the two transverse stripes only. 9th somite backwards transversely striped with yellow, three stripes per somite. A yellow lateral line with white and yellow streaks above it. Venter black, minutely streaked transversely with yellow and whitish. Legs black. Prolegs yellow with a black central streak. A few longish colourless hairs.

Pupa subterranean in a tough cocoon covered with earth. Mahogany brown, the venter paler. Thorax with a slight dorsal ridge. Cuticle punctate. Cremaster a double outcurved spine, with shorter straight spines below.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 25-v-44, buried 28-v-44 and a female emerged 27-vi-44.

Clethrophora virida Heyl.

Pupa in a long spindle-shaped cocoon of pure white, tough, papery silk, longitudinally wrinkled. Pale green, a broad, dark brown, dorsal stripe on thorax and abdomen. Apex of the abdom-

en blunt. Both the cocoon and pupa are very Lasiocampid-like in appearance, the cocoon could quite easily pass for that of a *Cosmotriche* but for lack of the protruding larval hairs.

Described from a cocoon found at Tukdah (5,000 ft. Darjeeling District) 15-v-44, from which a female emerged 29-v-44.

Sypna curvilinea Moore.

Head yellow green. Body yellow green, minutely dotted with reddish, and with a white dorsal stripe tinged with purplish on the 12th somite. Skin between the head and first somite black but only visible when the head is extended. 1st somite with two transverse series of white dots. 2nd and 3rd somites with a transverse series of four white dots. 4th with two subdorsal and a lateral, and a larger subdorsal dot between it and the 5th somite. 5th to 9th somites each with two subdorsal, two lateral and two sublateral white dots. 10th with two subdorsal and three lateral. 11th with two subdorsal and one lateral. Venter green with a double whitish stripe. Legs pinkish. Prolegs orange, the first pair much reduced. Spiracles reddish with a white centre.

Pupa in a spun together leaf. Very dark brown, almost black, the wing-cases and intersegmental areas paler. Cremaster a bunch of hooked spines.

Food-plant—*Rubus* sp.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 18-v-44, spun 22-v-44 and a male emerged 13-vi-44.

Adris tyrannus Guen.

Head olive black. Body purple-black with a dull purple-pink subdorsal stripe, paler at the edges and darker centrally, and a similar lateral stripe, most marked on the thoracic somites and interrupted by the ocelli and lateral markings on the 9th and 10th somites. 1st somite with two bright blue dots at the base of the leg, two sublateral yellow dots, the anterior one with a blue dot above it, and a lateral blue dot. 2nd somite with an anterior transverse series of six and a posterior series of eight blue dots, one at the base of the leg and a sublateral, yellow, open ring. 3rd somite similar but with the yellow ring replaced by a yellow streak. 4th somite with a subdorsal triangle of three blue dots, a large yellow lateral spot, a sublateral triangle of three blue dots, with an irregular yellow spot below and two blue dots below that. 5th and 6th somites each with an anterior and a posterior subdorsal blue dot, a large lateral ocellus consisting of a black pupil containing a blue crescent below, surrounded by a ring, wide and cream anteriorly and narrow and orange behind, a sublateral triangle of three blue dots with a few minute yellow streaks and two more blue dots below. 7th and 8th somites each with a subdorsal triangle of three blue dots, rather paler than the others, with a yellow streak between the basal pair, four sublateral blue dots with a reticulated yellow marking and one blue dot at the base of the proleg. 9th somite similar but the yellow reticulations extending:

over the lateral and sublateral area, enclosing the blue dots and speckled with black. 10th somite with a subdorsal yellow streak joined to the patch on the 9th somite, a subdorsal triangle of three blue dots and two slightly larger lateral and two sublateral blue dots with yellow streaks between. 11th somite humped, the top of the hump crimson, with four blue dots and a yellow blotch at the side, an anterior subdorsal, three lateral and two subdorsal blue dots. 12th somite with a double dorsal blue dot, a lateral triangle of three and a sublateral pair, with an elongate yellow ring between, and a cream mark posteriorly extending to the side of the anal flap. Venter, legs and prolegs black, the first pair of prolegs aborted.

Pupa in a slight cocoon spun between leaves. Very dark mahogany brown, the cuticle minutely punctate but shining, the wing-cases rugose. Apex of the abdomen longitudinally wrinkled. Cremaster a bunch of hooked spines.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 18-v-44, spun 26-v-44 and a male emerged 14-vi-44.

Plusiodonta coelonota Koll.

Moore, *Lep. Ceyl.*, iii, 75, pl. 153, fig. 1a. 1884-87.
Hamps., *Fauna Brit. Ind.*, Moths, ii, 578. 1894.

Young larva—Head deep yellow. Ground colour of body greenish grey, 1st somite with a black subdorsal spot, 2nd and 3rd each with a black lateral spot, 4th to 12th somites each with a black subdorsal spot. Legs and prolegs pale grey, the first two pairs of prolegs obsolete.

Full grown larva—Head orange. Body blackish. 4th somite backwards streaked and speckled with greyish blue. 4th somite with a lateral white spot, 5th with white reticulations dorsally, 7th somite with the dorsal area grey, the rest whitish, 11th somite with a white lateral blotch.

Cocoon of whitish silk covered with fragments of chewed leaf, shuttle-shaped. Pupa dark purple brown. The cremaster a broad transverse ridge with a slight point at each end.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 14-vi-44, spun 15-vi-44 and a male emerged 1-vii-44.

Moore's description is 'Larva with twelve legs; violet-black, with grey speckles and streaks; a purplish patch on eighth and twelfth segment; head reddish. Pupa narrow, purplish-black, enclosed within an elongated purplish-grey streaked cocoon. Feeds on *Cocculus macrocarpus*.' The figure shews a grey-speckled blackish larva with large white patches. Hampson's description is as follows:—'Purplish black with grey specks and streaks; the 7th and 11th somites with pinkish patches; head reddish'.

Dichromia quadralis Wlk.

Head yellow, two transverse series of eight black dots above the jaws, above which is a larger central spot, and then two further

series of four and two. Body dull green, a blackish dorsal and lateral stripe, the latter edged above and below with yellowish. The 4th to 6th and 11th somites banded transversely with blackish. 1st somite with two transverse series of six black dots, 2nd and 3rd each with four and a sublateral triangle of three. 4th to 11th somite with an anterior and posterior subdorsal black dot and a sublateral triangle of three. 12th somite with an anterior subdorsal dot and a posterior transverse series of six. Anal flap with two anterior and six posterior black dots. All the black dots giving rise to colourless hairs. Legs black. Prolegs green, the first pair obsolete, with a black spot at base and an external black streak. Anal claspers yellowish dotted with black. Venter green with transverse series of black dots.

Pupa in a spun together leaf. Pale chestnut brown. Head with a median black spot, a bar on the eye and a spot above it. Pro-thorax with a subdorsal black spot. Meso-thorax with a subdorsal black lunule, a lateral streak and a sublateral spot. Meta-thorax and abdomen with black transverse bands. Leg and wing cases streaked with black. Cremaster a bunch of hooked spines.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 8-vi-44, pupated 11-vi-44 and a male emerged 23-vi-44.

GEOMETRIDAE.

Dindica polyphaenaria Guen.

Head green, rectangular and slightly notched above. Body leaf green minutely shagreened with white points. A subdorsal whitish-yellow line and a lateral white line from the base of the third pair of legs backwards. Very obscure oblique white lines between the subdorsal and lateral lines. A narrow yellowish ventral stripe with a series of oblique yellow lines between it and the lateral line. 1st and 2nd pairs of legs green, the 3rd pair pink with the base dark brown. Prolegs green. Anal flap produced into a blunt point. Spiracles dark red.

Pupa in a spun together leaf. Dull olive brown, the wing cases greener. Head and prothorax each with a small double dorsal tubercle. A lateral pit between the 4th and 5th abdominal somites. Cremaster a stout spine.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 24-vi-44, spun 28-vi-44 and a female emerged 10-vii-44.

Iodis argutaria Wlk.

Head green, bifid above, the points purplish. Body green, suffused on the dorsum with purple, the suffusion most pronounced on the intersegmental divisions. Shape very long and slender, the anal flap produced to a point.

Pupa in a slight web among leaves. Bright leaf green, the dorsum slightly darker. Head truncate.

Food-plant—*Rubus* sp.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 22-v-44, spun 27-v-44 and a female emerged 10-vi-44.

Osteosema sanguilineata Moore.

Head greenish, rounded. Body curiously knobbed giving the impression of a catkin covered with small galls. 1st somite with a transverse series of six very small knobs anteriorly and a larger subdorsal and lateral knob posteriorly. 2nd somite with a double dorsal, a very large subdorsal and a lateral knob. 3rd somite similar. 4th with three small dorsal knobs, one anterior and two posterior, a very large subdorsal, a lateral and a sublateral. 5th to 8th with a divided dorsal knob anteriorly and a double one posteriorly, a large subdorsal, a lateral and a sublateral. 9th and 10th with a small paired dorsal knob, a large lateral and a sublateral. 11th somite with a transverse series of four large knobs. Colour greenish, the knobs, particularly the large ones, more or less tinged with purplish. Traces of a dark dorsal, lateral and ventral line. Legs and prolegs greenish.

Pupa in a leaf spun together with thick strands of brown silk. Head truncate, shape fairly stout. Colour green, the wing cases darker. A dorsal series of minute purple specks on the abdomen and a lateral series of small raised purple spots. The veins of the wing cases raised.

Food-plant—*Maesa chisia* Don.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 2-v-44, pupated 14-v-44 and a female emerged 3-vi-44.

Cidaria delecta Btlr.

Head yellow green surrounded by a brownish ring. Body green, a blackish dorsal and a white subdorsal line, the latter with two black specks above it on each somite from 4th to 8th. A diffused pinkish sublateral stripe. Venter with a blackish median line and transverse series of white specks. Legs green, the 3rd pair tinged with pink. Prolegs green tinged with pink. Those larvae that feed on creeper with pink leaves are suffused with pink, the dorsum from 1st to 9th somite less than the rest of the body.

Pupa in a spun together leaf. Yellow green, minutely streaked with blackish and suffused with golden. A blackish dorsal and ventral line and a dark V outlining the meso-thorax. A subdorsal series of black dots.

Food-plant—*Virginia Creeper*.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 8-vi-44, spun 13-vi-44 and a male emerged 25-vi-44.

Cidaria aurigena Btlr.

Head green, with a black-brown central line. Body transparent blue-green, a dark pulsating dorsal line and a dark line which appears subdorsal when seen from above and lateral when seen

from the side. A white spiracular line. Venter transparent green with a dark median stripe due to the contents of the intestines shewing through. Legs and prolegs green. Shape tapered from head to anal somite.

Pupa in a spun together leaf. Pale green, the thorax and wing cases a transparent, glassy green. Cremaster a spike armed with hooked brown spines.

Food-plant—*Impatiens* sp.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 28-v-44, spun 1-vi-44 and a female emerged 12-vi-44.

Cidaria silaceata Schiff.

Head yellow green. Body purple, each somite with a median and posterior transverse series of minute white specks on the dorsum and venter. A dark lateral line edged below with paler. Venter with a median whitish line. Legs yellowish green. Anal claspers with an anterior white stripe, posteriorly tinged with greenish. Anal flap purplish tinged with green.

Pupa in a spun up leaf. Green, the dorsum on the abdomen tinged with pink and with a sprinkling of minute black specks. Venter with a black streak. Cremaster pink, triangular, ending in a bunch of hooked spines.

Food-plant—*Impatiens* sp.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 18-v-44, spun 24-v-44 and a male emerged 7-vi-44.

Photoscotia miniosata Wlk.

Sevastopulo, *Journ. Bomb. Nat. Hist.*, xl, 691. 1939.

Among a number of normal larvae collected at Tukdah, one had the green colour replaced by golden brown, the dorsal markings almost obsolete.

Usual mode of pupation is in a subterranean cocoon, not in a spun up leaf as previously described.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 20-v-44, pupated 23-v-44 and a male emerged 7-vi-44.

Phthonoloba decussata Moore.

Head very slightly bifid, the prominences blunt. Colour of head and body a clear orange pink, the intersegmental areas darker and with traces of a dark dorsal line. Venter whitish. Legs and prolegs pale orange pink. Anal claspers each with a backward pointing tooth.

Pupa in a slight web among litter. Bright, pale, orange brown, the wing cases tinged with green.

Food-plant—Rose.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 30-iv-44, pupated 5-v-44 and a female emerged 19-v-44.

Callabraxas amanda Btlr.

Head green, suffused with pale mauve and minutely speckled with black. Body mauve, minutely speckled with white, the dorsal area increasingly suffused with green from the 7th somite backwards, the lateral area from the 7th somite backwards yellow green. Venter green from the 9th somite backwards, 2nd and 3rd somites each with four black dots arranged in a diamond dorsally, 4th to 7th with three and 8th somite with two only, but larger. Prolegs green. Legs mauve.

Pupa in a spun together leaf. Pale yellowish green, the wing cases yellow. Pro- and meso-thorax each with two transverse series of minute black specks. 2nd to 6th abdominal somites with an interrupted black dorsal stripe. The subdorsal area with two lines of black dots. A double lateral series of black streaks and dots. An interrupted black ventral stripe on the 5th and 6th abdominal somites. Cremaster and terminal somite black, cremaster a stout spike ending in a double reddish spine.

Food-plant—An unidentified plant belonging to the Saxifragaceae.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 26-v-44, spun 4-vi-44 and a female emerged 24-vi-44.

Peratophya aerata Moore.

Head brown, some examples with a broad, blackish, central stripe. Body blackish, some examples tinged with green. A subdorsal line of white dots on 1st to 3rd and 9th to 12th somites, 5th and 6th somites with a white subdorsal spot anteriorly. A buff lateral stripe from 5th to 8th somite. Venter blackish with a dotted white central line. Legs black. Prolegs buff. Shape short and stout.

Pupa in a slight cocoon among litter, possibly subterranean in nature. Dark reddish brown, the thorax and wing cases dark olive. 6th and 7th abdominal somites with a transverse raised ridge. Cremaster a stout spine.

Food-plant—*Hypericum* sp.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 16-vi-44, pupated 18-vi-44 and a male emerged 1-vii-44.

Eurytaphria bisinuata Hamps.

Head small, green with a blackish V-shaped mark. Body green, the intersegmental areas silvery, with a dark dorsal stripe tinged with purple on the thoracic and posterior somites. 2nd and 3rd somites each with a dark crimson lateral speck. 5th to 8th somites each with a double sublateral dark crimson speck. Legs, prolegs and venter green. Spiracles set on black spots.

Pupa in a slight earthen cocoon. Pale chestnut, tinged with olive. The wing cases olive green. Cremaster a short, bifid-tipped spine.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 10-v-44, buried 15-v-44 and a female emerged 27-v-44.

Ectropis (Boarmia) bhurmitra Wlk.

Head triangular, flattened above, pale brown with a darker lateral line. Body dark brown. 1st to 4th somites with a darker subdorsal line, 5th somite with a darker dorsal V-shaped mark with a pale buff streak in front of each arm, 7th somite with a darker subdorsal line, edged below with paler. A pale diamond-shaped dorsal blotch on the 8th somite. 11th somite slightly humped and with a double, dorsal tubercle, a subdorsal pale mark ending at each tubercle with a very dark brown bar below. A pale streak along the abdominal proleg. Venter dark brown with a whitish median line. Legs dark brown. Shape fairly short and stout.

Pupa subterranean without any perceptible cocoon. Dark reddish chestnut, the wing cases olive. Cremaster a stout spike ending in two spines.

Food-plant—*Maesa chisia* Don., *Symplocos* sp., *Melastoma normale* Don. and a number of unidentified shrubs.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 14-v-44, buried 15-v-44 and a female emerged 4-vi-44.

Psyra spurcataria Wlk.

Head olive brown. Body olive brown, blotched and mottled with darker. Dorsal area of the 1st to 4th somites greenish with a dark median stripe. 5th and 6th somites dorsally bright chestnut speckled with canary yellow, the anterior edge of this area defined by a brown V-shaped mark with the apex directed forward. 7th somite with a greenish yellow triangular dorsal mark, the posterior portion of the somite dark brown, which continues as a narrowing dark brown dorsal stripe on the 8th and 9th somites after which it divides and runs to the anterior edge of the anal clasper. Venter tinged with greenish. Legs and prolegs olive brown. There is considerable variation in colour, some examples having the ground colour distinctly olive green and the dorsal marking on the 5th and 6th somites bright yellow green speckled with red brown, the dorsal mark on the 7th somite yellow green. One larva, which unfortunately was parasitised and so I cannot be absolutely sure of its identity, had the ground colour dull grey and the dorsal markings obsolete with the exception of a V on the 5th somite composed of brown-ringed white dots and traces of a similar V on the 6th somite. Shape peculiar and distinctive, the 5th somite anteriorly with a very short dorsal tooth, 6th somite with a long dorsal process bifid for the greater part of its length, and 7th somite with a short subdorsal tooth. Resting attitude with the head and first two somites folded back along the dorsum, the 2nd pair of legs holding the support and the 3rd pair the body near the abdominal prolegs, and the body humped so that the head is tucked

up against the dorsal tooth on the 5th somite and the process on the 6th somite stands erect.

Pupa in a slight cocoon among leaves, possibly amongst litter in nature. Very dark olive brown, almost black, the intersegmental areas paler. Wing cases with the veins raised. Cremaster a stout spin, the apex bifid.

Food-plant—Rose and a number of unidentified shrubs.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 15-v-44, spun 21-v-44 and a female emerged 8-vi-44.

Fascellina plagiata Wlk.

Head purple brown, slightly bifid above. 1st and 2nd somites dark chestnut, slightly paler laterally. 3rd and 4th somites dark chestnut dorsally with a subdorsal lilac line, olive brown laterally and paler chestnut sublaterally. 5th somite olive brown, a subdorsal lilac line, the sublateral area pale chestnut, and with a bright orange-brown dorsal projection with the tip bifid. 6th somite with the dorsal area lilac speckled with olive, shading through olive into pale chestnut sublaterally, and with a similar dorsal projection. 7th somite chestnut dorsally with a lilac dorsal stripe posteriorly, the subdorsal and lateral areas dark purple brown with a white sublateral spot. 8th somite with a heart-shaped yellow dorsal mark, two white subdorsal specks and a white sublateral dot. 8th to 12th somites with a broad chestnut dorsal stripe, the lateral area lilac. Venter dark chestnut on 1st to 4th somites and dark olive brown thereafter, a blackish median line on the 1st to 8th somites and white on 9th somite backwards. Legs black. Prolegs lilac. Resting attitude with the head thrown back, the 3rd pair of legs extended and the others folded flat, the body slightly humped.

Pupa in a spun up leaf. Very dark olive brown, almost black, the wing cases and intersegmental areas paler. Cremaster a bunch of hooked spines.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 9-vi-44, spun 10-vi-44 and a male emerged 27-vi-44.

Boarmia acaciaria Bsd.

Moore, *Lep. Ceyl.*, iii, 415, pl. 191, fig. 1b. 1884-87.

Hamps., *Fauna Brit. Ind.*, Moths, iii, 265. 1895.

Head buff, speckled with darker, rounded. Body leaf green, the intersegmental areas yellow-brown. 5th somite with a red brown subdorsal tubercle and a square dorsal spot edged with whitish on each side. 6th to 10th somites each with a subdorsal white dot anteriorly. 11th somite with a double white dorsal tubercle. Legs pinkish. Prolegs green. Venter green with median white speckling. Spiracles purple with a white centre.

Pupa subterranean in an earthen cocoon. Olive green tinged, except on the wing cases, with orange. 2nd abdominal somite with a subdorsal orange red blotch, 5th with a lateral black blotch. Cremaster a stout spine, bifid from about the middle.

Food-plant—Rose and Garden Pansy. Moore gives *Cinnamomea*, etc.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 20-v-44, buried 24-v-44 and a male emerged 12-vi-44.

Moore's description is 'Larva with 10 legs; green; with two purple-brown biconical dorsal prominences on sixth segment and two dorsal white spots on twelfth segment; head and legs pale purple-red; anterior and anal segments in male laterally black speckled, spiracles black ringed. Pupa red, greenish in front.' Hampson's description appears to have been based on that of Moore.

Medasina albidaria Wlk.

Head triangular, slightly bifid above, dark brown mottled with paler. Body dark olive brown, the lateral area of the 2nd to 4th somites greener. 4th somite with a buff, heart-shaped, dorsal mark. 5th somite expanded into a subdorsal tubercle and with a greenish-buff triangular mark dorsally, the mark containing two minute dorsal tubercles. 8th somite with a greenish-buff, heart-shaped dorsal mark. 11th somite with a transverse, raised, greenish-buff band. 8th to 11th somites marked with greenish-buff laterally. Spiracles red brown ringed with buff. Venter with the thoracic somites dark brown, 4th and 5th paler with dark mottling, 6th somite with a minute double tubercle centrally, 6th to 9th somites dark brown with an obscure paler median stripe, 10th and 11th somites whitish with a dark median line. Legs brown.

Pupa subterranean without any visible cocoon. Thorax and wing cases very dark olive brown, the abdomen chestnut with the intersegmental areas darker. Cremaster a stout spine, bifid at the tip.

Food-plant—Cherry, Rose.

Described from a full fed larva found at Tukdah (5,000 ft. Darjeeling District) 10-v-44, buried 12-v-44 and a female emerged 5-vi-44.

(To be continued.)